

WHAT IS CLAIMED IS:

1. A method of controlling the frequency of a surface acoustic wave device, comprising:
 - a quartz substrate; and
 - IDT electrodes formed on the quartz substrate, the IDT electrode exciting quasi-longitudinal leaky surface acoustic waves,
 - the frequency being controlled by controlling a thickness of the quartz substrate using a surface of the quartz substrate that faces the surface where the IDT electrodes are formed.
2. The method of controlling the frequency of the surface acoustic wave device according to Claim 1, the frequency being controlled by dry etching the surface that faces a surface of the quartz substrate where the IDT electrodes are formed.
3. The method of controlling the frequency of the surface acoustic wave device according to Claim 1, at least one of the surface of the quartz substrate where the IDT electrodes are formed and the surface of the IDT electrodes being etched, to preliminarily control the frequency before controlling the frequency.
4. A method of controlling the frequency of a surface acoustic wave device, comprising:
 - a quartz substrate; and
 - IDT electrodes formed on the quartz substrate, the IDT electrode exciting quasi-longitudinal leaky surface acoustic waves,
 - the frequency being controlled by arranging the surface acoustic wave device such that the quartz substrate is held in a package so that the IDT electrodes face downward in a chamber, to which an etching gas is introduced, and etching the surface that faces a surface of the quartz substrate where the IDT electrodes are formed until a desired frequency is obtained while measuring an input-output characteristic of the surface acoustic wave device.
5. A method of controlling the frequency of a surface acoustic wave device, comprising:
 - a quartz substrate; and

IDT electrodes formed on the quartz substrate, the IDT electrode exciting quasi-longitudinal leaky surface acoustic waves,

the frequency being controlled by arranging the surface acoustic wave device such that the quartz substrate is held in a package with an aperture so that the IDT electrodes face upward in a chamber, to which an etching gas is introduced, and etching the surface that faces a surface of the quartz substrate where the IDT electrodes are formed until a desired frequency is obtained while measuring an input-output characteristic of the surface acoustic wave device.

6. A method of controlling the frequency of a surface acoustic wave device, comprising:

a quartz substrate;

a surface acoustic wave element having IDT electrodes formed on the quartz substrate, the IDT electrode exciting quasi-longitudinal leaky surface acoustic waves;

an IC chip operating together with the surface acoustic wave element; and

a package,

the frequency being controlled by holding the IC chip on the bottom portion side of the package, arranging the surface acoustic wave device such that the surface acoustic wave element is held in the package so that the IDT electrodes face downward and cover the IC chip in a chamber, to which an etching gas is introduced, and etching a surface that faces the surface of the quartz substrate where the IDT electrodes are formed until a desired frequency is obtained while measuring an input-output characteristic of the surface acoustic wave element.

7. The method of controlling the frequency of the surface acoustic wave device according to Claim 4, at least one of the surface of the quartz substrate where the IDT electrodes are formed and the surface of the IDT electrodes being etched, to preliminarily control the frequency before controlling the frequency.

8. An electronic apparatus comprising a surface acoustic wave device as a filter or a resonator,

the surface acoustic wave device being a surface acoustic wave device whose frequency is controlled by the frequency controlling method according to Claim 1.

9. The method of controlling the frequency of the surface acoustic wave device according to Claim 5, at least one of the surface of the quartz substrate where the IDT electrodes are formed and the surface of the IDT electrodes being etched, to preliminarily control the frequency before controlling the frequency.

10. The method of controlling the frequency of the surface acoustic wave device according to Claim 6, at least one of the surface of the quartz substrate where the IDT electrodes are formed and the surface of the IDT electrodes being etched, to preliminarily control the frequency before controlling the frequency.